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IN THE

Supreme Court of the United States

October Term 1979.

SIDNEY A. DIAMOND, COMMISSIONER OF PATENTS AND TRADEMARKS,

Petitioner,

vs.

JOHN J. BRADLEY and BENJAMIN S. FRANKLIN.

SIDNEY A. DIAMOND, COMMISSIONER OF PATENTS AND TRADEMARKS,

Petitioner,

vs.

JAMES R. DIEHR, II, and THEODORE A. LUTTON.

BRIEF AMICUS CURIAE OF LOS ANGELES PATENT LAW ASSOCIATION.

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BRIEF AMICUS CURIAE OF LOS ANGELES PATENT LAW ASSOCIATION.

I.

The Question.

Whether the subject matter of a patent claim that specifies, in accordance with the requirements of 35 USC 112, means or steps for performing specified functions is non-statutory under 35 USC 101 merely because one or more of the means or steps may be implemented by the programming of a digital processing device.

II.

Consent.

This Brief Amicus Curiae is submitted on behalf of the Los Angeles Patent Law Association in support of Appellant Bradley, *et al.* and Appellant Diehr, *et al.* under Rule 36 of this Court. The consents of counsel of the various parties have been obtained to the filing of this brief and have been separately filed with the Court.

III.

Interest of Amicus.

The Los Angeles Patent Law Association is an organization of lawyers and patent agents primarily representing inventors in Southern California, where a large amount of computer development occurs along with a large amount of development of programs and their applications. This association appears here in an attempt to assist the Court and in an effort to assure orderly development of the patent law in the modern technological era in which programming of computers plays an important role. More particularly, Amicus is deeply concerned that Petitioner's briefs as a whole badly confuse the issues.

Much of the confusion arises because the language used by Petitioner has different meanings under different circumstances, and care has not been exercised by Petitioner to distinguish these meanings according to those circumstances.

Amicus has no interest in the patent applications of Respondents and does not consider itself prepared to form a judgment as to whether or not the inventions described and claimed there meet the standards of Sections 102 and 103.

It is the position of Amicus that Petitioner has mischaracterized the facts of the cases before the Court and has also

distorted much of the law, out of its zeal to obtain a particular ruling on an issue which is not even present in the cases before the Court.

It is also the position of Amicus that a properly claimed invention is not excluded from the classes of inventions recited in 35 USC 101 merely because it makes use of a program modified computer, and that, therefore the decisions of the court below should be affirmed.

IV.

Statutes Involved.

Section 112, paragraph 6, provides that:

> "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."

V.

Short Statement of Argument.

Petitioner seems to take the position that no matter what other merit an invention may have, if a claim directed to that invention can be practiced with the aid of a programmed computer that is a program-modified computer then the claim is nonstatutory. Amicus disagrees.

Computers and computer programming are becoming almost as common today as gears and valves. There is no valid reason for denying patentability to inventions that employ computers or programming under the present law than there is for denying patentability to inventions that employ gears or valves.

The main thesis of this brief by amicus is that programmed computers are modified physical things and remain physical

things after such modification and that programming of computers is also a physical thing or process. Such physical things, may be patentable in themselves or form parts of patentable combinations.

Writing a program is not the same thing as programming a computer. Writing a program is a literary effort, though highly technical. But programming a computer involves changing it in a way that makes it perform a new function.

Holdings of *Gottschalk v. Benson*, 409 U.S. 63 (1972), and of *Parker v. Flook*, 437 U.S. 584 (1978), have no bearing on these cases because there was no novel step in either of them that could not be carried out mentally, that is without physical aids. Furthermore, neither of them explicitly claimed a program-modified computer.

The Petitioner does not face the issue presented by the claims but attempts to obscure the issue by using ambiguous terms without clarification. He does not even distinguish a program *per se* written on a piece of paper which is merely literary property and a programmed computer which is a physical thing that embodies an invention.

Petitioner urges this Court to focus its attention on computer implemented *programs*. But the focus should be on program-modified *computers*. Petitioner is looking through the wrong end of the telescope.

Programmed computers are members of an old, even ancient, art that lies within the scope of the present patent laws of the United States.

The present patent law sanctions patents on inventions that involve programmed computers or modifying computers with programs.

VI.

Petitioner Has Mischaracterized the Issues in the Two Subject Cases, Since Neither Respondent Has Claimed a Program Per Se. The Real Issue Is Presented Above by Amicus.

It is important to distinguish several different concepts. First, an idea; second, an expression of the idea; third, a program *per se*; fourth, a programmed machine; fifth a process for operating a machine; sixth, a machine or process that utilizes a programmed computer; and seventh, a combination that may utilize a program-modified computer as well as other physical things. The most unruly and ambiguous terms used frequently by the Petitioner in his brief are "expression" and "program". But worst of all, nowhere does Petitioner recognize that programming of a computer modifies it thereby causing it to function in a different way. And this is the most essential fact of all.

Patentability of programs *per se* is not at issue in these cases. But the question defined by Amicus is at issue. The gap between the claimed inventions of Respondents and their ideas is a wide one.

Petitioner has presented the issues in *Bradley, et al.* and *Diehr, et al.* and also in the upcoming case *Diamond v. Sherwood*, No. 79-1941, with substantially the same stereotyped question, namely, "Whether a computer program . . . is patentable subject matter under 35 USC 101." In each case the blank part of the issue-defining clause makes reference to the general subject of the Respondent's invention. There are thousands of such general subjects. But in all these cases, Petitioner asks whether a "program" is patentable even though none of the Respondents claims a program, but only claims means or steps that may be implemented with a program-modified computer.

The issues framed by Petitioner are almost meaningless in these cases because the term "computer program" is subject to wide interpretation, none of which, however, justifies Petitioner's assertion that the Respondents are claiming a computer program. The failure of Petitioner to exercise care in the use of such terms as "computer program" and "expression" obscures the meaning and purpose of his arguments.

The inventions for which patents are sought by Respondents are defined by the claims, not by the conclusions of the Examiner and the Board, which only mischaracterize the inventions; and by the overly-broad questions upon which Petitioner appears to seek rulings by this Court.

Any broad statement that computer programs are or are not patentable could lead to grave misunderstanding and such a statement would not decide whether the claims presented in these cases are patentable. Hence Petitioner's definitions of the issues are inapposite.

Considering the loose manner in which the Petitioner employs various terms, he could interpret a negative answer to the questions presented by him as a signal to reject all claims to apparatus or processes that could be practiced in part or in whole by modifying a computer in any way whatsoever. This follows since Petitioner's framing of the question as he has, is tantamount to a representation that an answer would be dispositive of the *Bradley, et al.* and *Diehr, et al.* cases. But this is not really the case. The Court is implored to focus its attention on the claims before it rather than on the overly-broad question framed by Petitioner and the loosely worded arguments of Petitioner.

VII.

There Is Ample Judicial Precedent for Upholding the Decisions of the Court Below and No Judicial Precedent That Requires Reversing Those Decisions.

There is a common factor in *Gottschalk v. Benson, supra* and in *Parker v. Flook, supra* that has hardly been mentioned explicitly. That factor involves mental processes.

In *Benson*, an attempt was made to claim a mathematical algorithm per se completely apart from any apparatus. As a result, those claims read on a mental process. In holding Benson's claims non-statutory, this Court pointed out that the *claimed* invention "could be performed . . . without any apparatus" at all. *Gottschalk v. Benson, supra*, 68. In other words, this Court realized that the process claimed by Benson could be infringed by mental steps alone and hence, the claim would "preempt the mathematical formula or algorithm itself." The reference to "reentrant register" in Benson's claim 8 does not save the claim from the criticism just mentioned. As correctly pointed out in footnote 26 on page 25 of the Benson Petitioner's Brief

> "Claim 8 makes reference to the use of shift register at one stage of the claimed procedure. The Patent Office Board of Appeals made an administrative determination that this language did not restrict the use of the procedure to digital computers, because the term 'shift register' comprehended a piece of paper with pencilled notations on it."

Amicus has examined the Benson record and agrees that in this determination by the Benson petitioner was correct.

And in *Flook*, the critical element of the claim also was broad enough to read on mental operations. That element read,

> "Determining a new alarm base B1 using the following *equation* . . ." (Emphasis added).

There was nothing in *Flook* to limit the "determining step to a physical process.

Petitioner inpliedly admits that Benson and Flook do not constitute judicial authority requiring the denial of the claims of either Respondent. Instead Petitioner merely asserts (Pet. Br. p. 11) only on the "suggestion" that he attributes to this Court in the *Benson* and *Flook* cases that traditional computer programs . . . *i.e.* software . . . are unpatentable.

But what is a program? Petitioner explains (Pet. Br.* p. 8) that "computer programs . . . are simply the *expression* in language intelligible to the computer of the fundamental ideas of the computer user." (Emphasis added). By this definition a program is something external to a computer. Petitioner's definition becomes an absurdity when one attempts to apply it to the claims of the cases at hand. Anyway, it is confusing since computers are not "intelligible" except in a metaphoric sense. And at that, they can't understand a "user's ideas" as alleged by petitioner.

In any event, nowhere in the claims of *Bradley, et al.* or *Diehr, et al.* does one find any reference to an "expression in language intelligible to the comupter" of anything.

It is true that a computer program may be represented by a flow chart or a block diagram which, indeed, is an expression which is *understandable to a programmer* as to how to program a computer (see, for example, Bradley, J.A. 114-120 and Diehr, App. to Pet. for Cert. pp. 55a-56a.). A computer program may also be expressed in the form of a listing (see Diehr Pet. Br. pp. 8 and 19) or as a set of states of memory cells of a computer memory.

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*Where an abbreviation Pet. Br. or the like is employed, it refers to the Petitioner's Brief in the *Bradley, et al.* case, unless otherwise indicated.

Flow charts and program listings are "expressions" and both are copyrightable, but neither is patentable.

Under 35 USC 112 elements of claims are also "expressions" and certainly, the specification of a patent application is also an expression.

It would be a distortion of the patent law to say that a physical embodiment of an invention is an expression of the underlying idea especially if one were to argue, as the Petitioner does, that a claim that covers an embodiment of the invention is a patent on an expression that gives a monopoly on the idea as alleged!

As is well known, programs based upon such a flow chart or expressed in such a listing may be embodied in a set of punched cards, or in a microprocessor, or in a memory unit of a computer. When embodied in these machine forms, changes of state are involved, making the set of cards the microprocessor, or the memory unit a new "mechanical" device compared to what it was before. Obviously it is new if it functions in a new way.

In *White-Smith Publishing Co. v. Apollo Co.*, 209 U.S. 1, 18 this Court recognized that a perforated piano roll is a part of a machine, in other words a mechanical device. In more modern language it is also machine-readable. So also is a set of cards and a paper tape that has been punched or perforated in accordance with a program. And so also is a microprocessor or a memory unit of a computer in which the states of elements and the effective connections between then have been modified in accordance with a program.

A perforated piano roll contains a program that causes the sets of keys of a player piano to operate sequentially and otherwise to produce a musical effect. But it does not alter the structure of the piano. On the other hand, a deck

of punched cards or the like, when fed to a computer, changes it structurally so that it will function in a new way.

There is little doubt that a program listing corresponding to a set from punched cards, a perforated tape, a microprocessor, or a memory unit of a computer, is copyrightable. And producing a program listing corresponding from such cards, *et al.* would infringe a copyright on the original listing.[1]

Under the authority of *White-Smith Publishing Co. v. Apollo Co., supra* if follows that any physical thing or medium that has been programmed to function in or with a computer is a mechanical device. Any such mechanical device may be patentable under Section 101 or form part of a combination that is patentable under this same section, if properly claimed. Congress has already made it clear that if a computer program is copyrightable that fact does not preclude an inventor from obtaining a patent on an invention which utilizes a corresponding programmed device, that is a mechanical part based upon such program (17 USC 301(d)).

Even punched cards have been patented. The Board of Appeals itself of the Patent Office has been responsible for the issuance of a patent to IBM on cards punched with an extra row of holes and nonholes arranged to control the operation of a computer. *Ex parte Lang*, 56 USPQ 423 (1934).

In *Faulkner v. Gibbs*, 388 U.S. 267 (S.Ct. 1949) (see also *Gibbs v. T.Z.R. Amusement Corporation*, 14 F.Supp. 957, 961 for claim 9 quoted with changes below) this Court upheld claims which were held valid by the court below and

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[1]*Data Cash Sys., Inc. v. JS & A Group, Inc.*, 480 F.Supp. 1063 (N.D. Ill. 1979) is inapposite since the program had been published without notice before January 1, 1978, the effective date of the new copyright act.

which employed a special hard-wired program to determine the winner of a game. The claim even involved AND gates and OR gates. Such gates operate on mathematical principles. Written in modern language solely by the addition of the terms OR and AND, claim 9 read as follows:

> "9. A game apparatus comprising a a plurality of electrically connected units, each including a game board with a plurality of apertures therein, an an annunicator with a plurality of indicators thereon, electrical contacts adjacent each of said apertures connected in the circuits of said indicators, said indicators and said apertures corresponding in number and subdivided in corresponding groups, whereby when objects are deposited in said aspertures by the players at the several units, corresponding indicators will be energized, a supplementary signal circuit on each of said units, and AND means for holding said signal circuit open until all of the indicators of any group on each of said units have been energized, and for closing said signal circuit when all of the indicators of any unit have been energized, and OR means controlled by the closing of the signal circuit of the winning unit for discontinuing the signals and opening the circuits of the indicators on all other units." (Captalized words AND and OR have been added for emphasis and clarity.)

This claim covered a hard-wired calculator in the form of an electrical system programmed to determine the winner of a race between a number of players of marble games used to play a game that resembles "BINGO." The AND means and OR means functioned according to principles of Boolean algebra just as does a modern day computer. Such algebra could have been used explicitly to describe the invention. The AND and OR means were not called by these names at the time, and no reference was made to algorithms or programs, since such descriptive language had not yet come into common use. But certainly, changing the language to modernize the claims would not render them nonstatutory.

And the Court of Claims has held, after considering the *Benson* case, that claims based upon an analog disclosure was infringed by a combination in which some of the functions specified in the claims were carried out with the aid of a general purpose digital computer, *Decca v. U.S.*, 544 F.2d 1070 (Ct. Cl. 1975).

At page 1080 of the *Decca* case, in holding the patent valid and infringed by the United States Government, the Court of claims said it this way,

> "On these fact, infringement is not avoided by showing that digital instead of analog techniques are used in the accused system . . .
> Nor are defendant's arguments regarding the software any more persuasive. While Gottschalk v. Benson, 409 U.S. 63, (1972) held that computer programs were not patentable per se, claims 1 is clearly directed to a combination of elements and not just to a program. Nor does claim 1, as applied to Omega, read only on the program in the computer. Indeed, as defendant's expert testified at trial, the program accomplishes nothing by itself; it must be mechanized to achieve the navigational functions for which the Omega system is designed. Thus, defendant's argument that the burst filter, the tracking filter and the Kalman filter by which the Omega computer processes the data are 'mere abstractions' having no 'physical' existence is entirely beside the point. The theory on which, for example, the Kalman filter, is based, and the instructions or program for the computer itself, may be nothing nore than a set of equations, but the means for receiving the signals and processing them and the means for performing those instructions and achieving the end result quite clearly have a tangible, physical existence which meets the terms of the claim."

Since the Decca claims were held valid and infringed by the Decca court, clearly then such a claim defines statutory subject matter. The law cannot be otherwise. And now another agency of the United States Government is asking this Court to hold the use of computer programs renders

combination claims non-statutory. It is curious that Petitioner has not seen fit to call this Court's attention to the *Decca* case.

VIII.

Title 35 of the United States Code Authorizes Patents for Program-Implemented Inventions.

That the present patent law sanctions patents for program-implemented inventions is evidenced by the fact that one former Commissioner of Patents (Edward Brenner) failed in his attempt to have all claims that could be infringed by means of programmed computers removed from the field of statutory subject matter by Congress. Mr. Brenner was a member of the President's Commission for reform of the Patent System, while he was Commissioner of Patents.

Upon issuance of the Commission's Report, a so-called patent modernization bill—S.1042 (89th Congress, 2nd Session), sometimes called the President's Bill, was submitted to Congress. This Bill included the following anti-program protection provision:

> "§ 106. COMPUTER PROGRAMS NOT PATENTABLE.
>
> "A plan of action or set of operating instructions, in whatever form presented, to cause a controllable data processor computer to perform selected operations shall not be patentable."

This section was introduced into the bill to carry out a recommendation of the President's Commission[2] which read as follows:

> "The classes of patentable subject matter shall continue as at present, *except*:
>
> . . .
>
> "3. A series of instructions which control or con-

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[2]See p. 16 of Report of the President's Commission on Patent System, November 17, 1966 (hereinafter referred to as President's Patent System Report).

> dition the operation of a data processing machine, generally referred to as a 'program', shall not be considered patentable regardless of whether the program is claimed as: (a) an article, (b) a process described in terms of the operations performed by a machine pursuant to a program, or (c) one or more machine configurations established by a program." (Emphasis added.)

In support of the recommendations of the President's Commission, the Report[3] offered only following self-serving explanation to lend justification for its recommendation:

> The Senate Judiciary Committee did not approve S.1042. Though many so-called patent modernization bills have been proposed since that time, none has ever again proposed an anti-program protection provision.

William Schuyler, a later Commissioner, made the following comment:

> "The President's Commission to study the patent system recommended that computer programs be *excised*[4] from the patent system". (Italics added.)

The attempt to excise computer programs from the patent system failed. Inventions based upon programs are *already included* in the patent system and therefore constitute statutory subject matter under Section 101 and are patentable if the other conditions and requirements of Title 35 are satisfied.

The Patent Office, having failed to accomplish its goal in Congress through the President's Commission, has brought a series of cases before this Court to ask this Court to do what Congress declined to do.

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[3]President's Patent System Report, *supra*, p. 13.

[4]Schuyler, William E., Jr., "Protecting Property in Computer Software", reprinted from The Law of Software (George Washington University, 1969) in 3 Computer Law Service, Sec. 4-1, Art. 4.

This Court has no authority to extend the patent laws to cover subject matter not already covered. *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518 (1972). Nor does this Court have authority to excise from the patent laws subject matter that is already covered. Only Congress has the power to perform such excision. Petitioner should go back to Congress again if it wants computer programs to be excised from the present patent laws. *Application of Chatfield*, 545 F.2d 152, 156 (1976) cert. den. 434 US 875.

Considering that Congress has already declined to excise programs and program implemented inventions from the patent law and Petitioner's persistence in asking this court to do what Congress has declined to do, it is important that this Court clearly declare the meaning of the present law, at least insofar as it applies to program-implemented inventions.

IX.

The Claims of the Respondents, Bradley and Diehr, Satisfy the Requirements of 35 U.S.C. 112, and Therefore, Define Physical Things Not Non-Physical Things.

The question before this Court "is a narrow one of statutory interpretation requiring [it] to construe 35 USC 101". *Diamond v. Chackrabarty, supra, Parker v. Flook, supra.*

This Court agreed *unanimously* in *Parker v. Flook, supra,* that Sections 102 and 103 have no application in determining the proper construction of Section 101. Accordingly, the dicta of the majority in *Parker v. Flook* respecting the lack of novelty in the elements of the claims and the application (called abstract) presented by Flook, have no bearing on the present cases, especially since the Respondents are not claiming mathematical formulas or mathematical algorithms

in any sense of the words and their claims involve physical elements that exhibit novelty.

Section 112 of the Patent Act specifies how claims may be worded. More particularly, Section 112 says that an element in a claim for a combination—which is what is claimed by both *Bradley, et al.* and *Diehr, et al.*—may be "expressed" as a means for performing a specified function or as a step for performing a specified function, without, in either case, reciting specific structure, material or acts in support thereof. There is no exception in Section 112 with respect to a programmed computer or any part thereof, whether claimed alone or as part of a combination. Furthermore, as in the *Decca* case, *supra*, such a claim is to be construed by the Trial Court to cover the corresponding structure, material or act described in the specification, and equivalents thereof.

Claims properly drawn in accordance with Sec. 112 cannot read on mental operations or ideas because the human mind is not a "digital computer or its equivalent." *Application of Bernhart and Fetter*, 417 F.2d 1395 (1969) at 615 and 616. They cover only the physical embodiment of the invention disclosed and its equivalents.

P. J. Feiderico has pointed out that *Gibbs* provides for patenting anything under the sun that is made by man. *Diamond v. Chakrabarty, supra*, note 6. Anything refers, of course, to physical things not just ideas or other non-physical things. The mathematical algorithms and equations of *Benson* and *Flook* are not physical things. But programmed computers are physical things and hence constitute statutory subject matter under Sec. 101. And combinations that involve physical things constitute statutory subject matter even if a property, or relation involved is defined in mathematical terms. *MacKay Radio and Television Co. v. Radio Corp.*, 306 U.S. 86 ((1939); *Faulkner v. Gibbs*,

supra; *Gottschalk v. Benson, supra* (1972); *Parker v. Flook, supra*, or the inventions utilize natural laws that may be described mathematically. *Eibel Process Company v. Minnesota Ontario Paper Company*, 261 U.S. 45 (1923).

In *Benson* and *Flook*, the real difficulty was that the offending steps covered mental acts and thus on their face would render persons who performed such mental acts liable for infringement and there was nothing else new in the physical aspects of the claims.

The claims of *Benson* and *Flook* did not meet the standards of Sec. 112, paragraph 6, but the claims of the present Respondents do.

If the standards of Sec. 112, paragraph 6, are met, then the claims cover physical things, not abstract things such as ideas and mathematical algorithms. The presence of such apparatus and processes in the claims render them statutory under Sec. 101.

Claim 1 which is typical of the *Bradley, et al.* case calls for a multi-programming computer together with first means . . ., second means . . . , third means . . . , and fourth means . . . all for performing specified functions. These claims, therefore, cover only the physical system disclosed by *Bradley, et al.* and equivalents thereof. They do not cover mental steps and cannot be performed without the aid of any apparatus at all as was the case in *Benson*. In the *Diehr, et al.* case, claim 1, which is representative of most of the claims, specifies a method that involves calculating with the aid of a digital computer. The very language of this element eliminates any argument that it covers a mental process. Furthermore, the claim specifies numerous physical steps that are interrelated with frequent temperature measurements and the calculations, all in a way not present in either *Benson* or *Flook*.

Claim 11 is somewhat different. It specifies a determining step which by its terms may be performed mentally. But the physical steps are all interrelated in what appears to be a new way. And even though newness should not be considered except under Sec. 102, this fact distinguishes the claim clearly from any involved in the *Flook* case, where the non-calculating steps were admittedly all old. The determining step of *Diehr, et al.'s* claim 11 really makes the claim complete so that all the other physical steps may be more readily understood, also distinguishing claim 11 from the claims of the *Flook* case.

Amicus believes that all the claims at issue meet statutory standards and define statutory subject matter.

X.

Ideas and Mathematics Are Not Protected by Patents, but Only Inventions. Likewise Ideas Are Not Protected by Copyrights, but Only Certain Expressions.

The Petitioner employs confusing arguments in its attack on the patentability of program-implemented inventions. Petitioner discusses programs as "expressions" of ideas.

While the line between a patentable invention and an idea does not always shimmer with clarity, *Parker v. Flook supra* 456 in the cases at hand, a wide gap, amounting to a legal barrier, lies between a programmed computer or a process of using one and an idea on which it is based. Petitioner does not seem to recognize that this gap exists, but seems to attempt to include a programmed computer under the heading "expression", thus smothering the fact that an invention is far more than an "expression." That gap includes flow charts, program listings, and descriptions.

There is a wide gap between an idea for a program and the implementation of a program in a computer and still a

wider gap between an idea for employing a programmed computer in a combination and the combination itself. There are many lines in that wide gap that separate patentable program-implemented inventions from ideas. The inventions claimed by Respondents lie outside that gap on the patentable implementation side thereof.

The meaning of the term "idea" itself is obscure. Deller defines an idea as an intellectual notion that a thing may be done and if done might be of practical utility. Deller's *Walker on Patents*, Section 101. Respondents' claims would not protect such an idea "but only the structure, material, or acts described in the specification and equivalents thereof.". 35 USC 112, paragraph 6.

The recommendation of Petitioner that program protection be left to the copyright law (Pet. Br. p. 24) because Congress now has such questions under consideration is misleading. What Congress has under consideration is a recommendation that common law rights and state statutory rights of a kind that may now benefit program proprietors fairly explicitly under 17 USC 117, be abolished by repeal of that section in its present form.

Expressions of ideas are copyrightable provided they are works of authorship fixed in a tangible medium of expression. But copyrights on expressions do not give the copyright proprietor a monopoly on his idea. 17 USC 102(b). See also Nimmer on Copyright, Section 2.03[b].

The fact that a written expression of a program may be copyrightable does not preclude allowance of claims that include an element in the form of means or steps for carrying out the function involved. 35 USC 112, 17 USC 102(b) and 301(d). And copyright protection of a program can never substitute for the patent protection of a program-implemented invention.

XI.

The Art of Computer Programming Is of Ancient Origin.

There is a myth circulating throughout the land that algorithms and computer programs involve new concepts which came into existence only after the present patent code was enacted in 1952 and hence lie outside the patent laws. This myth is false.

Beginning about 1939 IBM and later the United States Government supported the development and use of the MARK I computer at Harvard University[5]. In 1943 the United States Government commenced the support of the ENIAC at the Moore School of Engineering at the University of Pennsylvania. Both computers involved programming with electrical devices. But that was not the beginning. Many ancient devices were programmed mechanically to perform needed calculations.

Ancient inventions that involved algorithms, radices, calculations and "programs" included the planetarium of Andronika,[6] the Antikythera device,[7] odometers of ancient China,[8] Greece[9] and Rome,[10] and clypsedrae.[11] The idea

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[5]Goldstine, *The Computer from Pascal to von Newmann*, Princeton University Press, (1972) pp. 151 ff;

Harvard staff of the Computer Laboratory, "A Manner of Operation for the Automatic Calculator, Vol. I", (Harvard University Press, 1946).

[6]Price, Derek de Solla, "The Tower of the Winds", pp. 387-396 National Geographic, Vol. 131, April 1967.

[7]Price, Derek de Solla, "An Ancient Greek Computer", pp. 60-67 Scientific American, June 1959; and "Gears from the Greeks", Trans. Am. Phil. Soc. Vol. 64, November 1974.

[8]Needham, Joseph, "Science and Civilisation in China", Vol. 4, Part 2, (Cambridge University Press, 1965), pp. 281-286.

[9]Cohen, Morris R. and Drabkin, I. E., "A Source Book in Greek Science, p. 342 (McGraw-Hill, 1948).

[10]Gwilt, Joseph, "Architecture of Marcus Vitruvius Pollio," (John Weale, London, 1860), pp. 249-251.

[11]*Singer, Charles, et al.*, "A History of Technology", Vol. III, (Oxford at the Clarendon Press, 1957), pp. 601-603;

Drachmann, A. G., "Ktesibios Philon and Heron, A Study in Ancient Pneumatics", (Ejnar Munksgaard—Copenhagen, 1948), pp. 16 ff.

behind clypsedra, which were water clocks, was to perform very advanced calculations to indicate the time of day in an era when the lengths of the hours changed from day to day. This need arose because daylight which extended from sunrise to sunset was divided into 12 hours of equal length and nighttime which extended from sunset to sunrise also consisted of 12 hours of equal length. Some of the clypsedra are believed to have been programmed partly by means of gears and rotating charts to perform the needed calculations automatically. It is said that such geared water clocks were also used as late of the 17th century. Other clypsedrae are believed to have been programmed by manually adjusting the rate of flow of water into a vessel by means of a calibrated valve from day to day according to the season. Such programs they had both in machines and in processes. But we know little about them because the Greeks had not learned the value of a patent system for advancing the useful arts.

In about 1580 A.D., Rudolfus II, emperor of the Holy Roman Empire, granted Rückert a patent on a programmed recording pedometer that was used to survey the emperor's land.[12] This paper-tape recorder was programmed to be operated by a pedometer to mark the distances traveled on a narrow strip of paper as the pedometer was carried along the course being surveyed.

Blaise Pascal developed a calculating machine in 1642 for performing arithmetic calculations in different coinage

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[12]Rohde, Alfred, "Die Geschichte der Wissenschaftlichen Instrumente vom Beginn der Renassance bis zum Ausgang des 18. Jahrhunderts, (Leipzig, Klinkhardt & Biermann, 1923).

systems, *e.g.* French or English.[13] The programs for adapting the calculator to operate with different coinage systems (which operated on different radices) were embodied in different sets of gears. Pascal's calculator even performed a carry operation automatically. Louis XIV granted Pascal a patent on his calculator in 1649 A.D.[14]

Charles Babbage pioneered the development of general purpose computers beginning in the early part of the nineteenth century. Programs consisting of series of written instructions to be embodied in Babbage's mechanical calculators were published in 1840 and 1872.[15] The programs were actually embodied in punched cards that formed parts of his machine.

The Scheutz family actually reduced some of the Babbage inventions to practice in about 1850.[16] One of their calculating machines, patented in Great Britain in 1854, was transferred to the Dudley Observatory at Albany, New York, in 1856, where it was then employed for stamping plates for printing books of mathematical tables beginning in 1857.[17] When it was delivered to Albany, the machine was accompanied by an explanation of the procedure for converting its operation from one number system to another, *i.e.*, from one radix to another.[18]

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[13]Bishop, Morris, "Pascal, The Life of Genius, (Reynal & Hitchcock, N.Y., 1936), p. 28.

[14]Prager, Frank D., "Examination of Inventions from the Middle Ages to 1836" XLVI JPOS268, 280 (1964).

[15]Morrison, Philip and Emily, "Charles Babbage and His Calculating Engines", (Dover, 1961).

[16]Merzbach, Uta, "George Scheutz and the First Printing Calculator", Smithsonian Studies in History and Technology, Number 36, (Smithsonian Institution Press, 1977.)

[17]Merzbach, *id.*, p. 26. One of the books is the National History Museum of the Smithsonian Institution.

[18]Merzbach, *id.*, p. 28.

Stibitz U.S. Patent No. 2,668,661 for which application was made April 19, 1941, was granted on a digital calculating machine which, among other things, was programmed to operate with radices 2 and 5 and to perform a carry operation. Claim 2 of that patent reads:

> "In a calculating device, a summing means comprising augend relays for representing a numerical value to which another numerical value is to be added, addend relays for representing the latter said numerical value and sum relays for representing the resulting sum of said values, an electrical circuit system for each set of one augend, one addend and one sum relay including incoming carry 0 and carry 1 leads for alternatively electrically characterizing outgoing carry 0 and carry 1 leads, the outgoing carry leads of one set of said relays being connected to the corresponding incoming relays, and means including said incoming carry leads and the augend and addend relays of a set for controlling the sum relay of said set."

The foregoing claim went into more detail than is now required under 35 USC 112.

The Eckert and Mauchly patent 3,120,606 for which application was made June 22, 1947, for the ENIAC computer includes the following claim which makes specific reference to "program means" for performing certain functions of the computer:

> "96. In a multipurpose computer, a multiplicity of pulse responsive units each having an input and an output, at least one unit including means for performing an arithmetic computation on two pulse signals received at a radio frequency rate at its input, said unit including means operative to develop pulse signals at a radio frequency rate at its output to represent the computed result; a source of input data including means for reproducing the input data in the form of pulse signals at a radio frequency rate, *program means* for routing the pulse signals from said source and from the output of at least one of said units to the inputs of the units in a selected order to cause a sequence to be

selected for a particular problem, and output means responsive to the computed result." (Emphasis added).

These are just samples of patents on programmed computers that were old art in 1952 when the present patent law took effect.

Thus we see that programming is an old, indeed ancient, art in the field of computer technology. So it is not reasonable to urge that computer programming is a new technology which does not constitute patentable subject matter because Congress could not have had it in mind when it enacted the Patent Law of 1952.

Any rule that a new technology remains unpatentable until Congress recognizes it, would defeat the purpose of the Constitution. Even so, computer programming would be outside any such rule.

XII.

Programming a Computer Cannot Convert a Statutory Computer Into a Nonstatutory Computer.

Petitioner has presented many arguments to the effect that programming of computers cannot constitute statutory subject matter. Its arguments are based upon strange suppositions about mathematics, radices, mathematical algorithms, and so on.

If the Petitioner's reasoning were to be accepted and carried to its logical conclusion, even computers themselves would be removed from the scope of Sec. 101. *Application of Walter*, 618 F.2d 758, 769.

Petitioner argues that patenting of program-implemented inventions would create monoplies in unpatentable ideas. If that view of the law is sanctioned by this Court it will be argued next that such reasoning applies to all inventions. Hence, Petitioner's arguments that attack program-implemented inventions must be rejected.

Granting that computers themselves constitute statutory subject matter it necessarily follows that if the computer has been programmed, it still remains statutory subject matter. And claims that specify the computer in such programmed condition or the functioning of a computer in accordance with such condition properly define such subject matter.

XIII.

Other Arguments of Petitioner Are Also Specious.

There seems to be no limit to the number of specious arguments that Petitioner has in its arsenal. But it does not have even one good argument. Some of those specious arguments not discussed above are mentioned briefly below.

Petitioner argues (Pet. Br. p. 11) that a programmed computer is not a new machine. In this, it ignores the fact that a machine is new, if the states or conditions of its elements are new. *Bernhart* and *Fetter, supra* 1400. Greater invention is often required in the setting of states of myriads of memory cells of a computer memory unit, than in the setting of an angle between two antenna arms. (*Mackay Radio and Television Co. v. Radio Corp., supra*), or the setting of the location and pitch of a wire (*Eibel Process Co. v. Minnesota Ontario Paper Co., supra*).

Petitioner argues (Pet. Br. p. 16) that an old computer which has been programmed in a new way does not involve a new use of an old machine. This is like saying that a device constructed of parts of an erector set cannot constitute a new device, since all the parts were there from the beginning. As explained by P. J. Federico at 35 USCA 17, the term "new use" of Section 101 "simply indicates that the procedural steps of a patentable process might be old." And even if every part of a combination is old, it may still be a patentable invention, that satisfies Secs. 102 and 103

as well as Sec. 101. *Deepsouth Packing Co., Inc. v. Laitram Corp.*, 406 U.S. 518 (1972)

Petitioner argues (Pet. Br. pp. 8 and 17) that every program that comes into existence and is employed for modifying a computer, was inherent in that computer. That is like saying that all chemical compounds, including microorganisms, that are brought into existence by man are not patentable because they are inherent in nature or that the combination of parts that form a new oil well tool that increases the recovery of oil are inherent in the operations of a machine shop.

The argument of inherency also fails where the program modified computer performs either by itself or in combination with another physical thing a function which the unprogrammed computer could not perform. A newly programmed computer makes use of a new combination of some of the billions of billions of billions, etc. of inherent functions, just like a new chemical compound is a new combination of old atoms.

Petitioner argues (Pet. Br. p. 20) that a computer program is no more patentable than a recipe in a cookbook. That is true only to the extent that the program is only a written expression like the recipe in a cookbook. But the argument does not apply to a program-modified computer. Interestingly, the oldest patent systems known, namely a patent system that is said to have existed in ancient Greece[19] provided for patenting of recipes. Furthermore, recipes satisfy the broad dictionary definition of algorithm.

The Petitioner, in a very natural way, as is common in the computer industry itself, takes an anthropomorphic view

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[19]Phylarchus, "Ancient Monopolies", XIV JPOS 348.

of computers. At page 8 of its brief it talks about "instructions" that are only understandable by a computer. And at page 13 of its brief, Petitioner highly exaggerates the capability of a computer by saying that it "comprehends" the translation of an idea into computer language. Such language can only serve to confuse the issue. Sets of electrical signals are received by and stored in modern computers and manipulated by them and (usually) new sets of signals are produced. Programmers and other users of computers understand and comprehend the signals and the input signals may come from other machine parts and the output signals may be fed to other machine parts. But computers don't understand or comprehend anything. They only respond and control.

In about the year 996 A.D., it is said, a successful computer was destroyed because it was believed to have supernatural powers.[20] Exaggerating the capability of computers could lead to their destruction of the incentive to expand their use with new programming.

Petitioner's argument that a computer operates necessarily upon mathematical principles has no relevance to the present questions. Pythagoras philosophized in the 6th century B.C. that all existing things can be described by mathematical principles. That philosophy persists, and the patent laws were enacted by men who must have been familiar with that philosophy of the world. Computers have operated on mathematical principles since time immemorial and many of them have been patented. There is no reason to change the rules today.

At page 23, the Petitioner suggests that the relations of the Federal law of the United States to the laws of certain

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[20]Rosenberg, Jerry M., "The Computer Prophets", (Macmillan, 1969).

foreign countries would be impaired if the decisions of the Court of Customs and Patent Appeals in these cases are upheld. And how about our relations with countries that do grant patents based on program-implemented inventions? Petitioner must know that patent applications which have been rejected as protecting programs by patent examiners in foreigh countries have been held to be patentable by the courts of those countries.[21] Petitioner again is asking this Court to do the work of that is delegated by the Constitution to Congress.

XIV.

The Time is Ripe for This Court to Declare That Program-Implemented Inventions Constitute Statutory Subject Matter.

The Petitioner has brought a parade of cases before this Court in an effort to establish that programs and program-implemented inventions do not constitute statutory subject matter. And these cases continue to be brought here, in spite of the fact that Petitioner has already made several attempts to have such inventions excised from the patent system, once through Congress and then repeatedly by this Court.

Petitioner states (Pet. Br. p. 13) that it has 3,000 more cases, which may be employed to continue that parade. It can be presumed that most of the 3,000 cases still pending before the Patent and Trademark Office contain claims

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[21]*Siemens AG v. Allegemeine Electrizitäts-Gesellschaft AEG-Telefunken*, (decided June 7, 1977 by the Supreme Patent Court of West Germany) International Review of Industrial Property and Copyright Law, 363, published by the Max Plank Institute for Foreign and International Patent, Copyright and Competition Law (Munich). See also In the Matter of *AN APPLICATION* by *INTERNATIONAL BUSINESS MACHINES CORPORATION* for the Revocation of Letters, Patent No. 1,352,742 in the *FREDERICK NYMEYER* (decided October 16, 1978 by the Royal Courts of Justice of the United Kingdom and not appealed), ... RPC ....

which are even farther from Benson and Flook than the cases now before this Court. It is therefore suggested that the recognition by this Court at this time that the kinds of claims now before this Court constitute statutory subject matter under present law will encourage Petitioner to proceed to examine those cases under Sections 102 and 103 as it should, and avoid further delay in the issuance of patents on such applications. As to those cases that are still pending in the Patent and Trademark Office that come within the holdings of *Benson* and *Flook*, it can be assumed that most can be disposed of by the Examining Staff and the Board of Appeals and the Court of Customs and Patent Appeals without further burdening this Court.

It is not necessary here to find the exact location of any shimmering line between ideas and mathematical algorithms on the one hand and their patentable applications on the other. In the present instances, there is a wide gap which separates unpatentable ideas from patentable program-implemented inventions. Petitioner has obscured the real issue by disregarding the contents of the gap by simply referring to certain kinds of "expressions," *e.g.*, flow charts and listings, and has implied that Respondents seek to patent such expressions. (Pet. Br. p. 14) Nothing could be farther from the truth. Respondents here do not seek to patent flow diagrams or program listings or even computer programs *per se*. They do seek to patent inventions that are not defined in terms of programs but which in practice are implemented by programming of computers.

Petitioner is probably still flinching from criticisms that it has spawned too many patents in the past. *The Great Atlantic and Pacific Tea Company v. Supermarket Equipment Corp.*, 340 U.S. 147, 158 (1950). The Petitioner needs to be assured that properly claimed inventions constitute statutory subject matter even though they may be partly or

even wholly implemented with the aid of programmed computers and that programming of computers to practice an invention does not convert a claimed invention as a whole into an unpatentable idea. Petitioner needs to be assured that there is nothing in the present statutes that excluded program-modified computers from the patent system.

XV.

Conclusion.

It is submitted that there is ample authority for upholding the decisions of the Court below and no authority for reversing those decisions, and that the claims before the Court constitute statutory subject matter under the present statutes. Amicus therefore urges this Court to affirm the decisions of the Court below.

Respectfully submitted,

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